Apollo VPX/97 PCIset

EP-51VPXC

ISA PCI MainBoard

with Onboard PCI IDE and Super Multi-I/O.

TRADEMARK

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The specification is subject to change without notice.

V011

Read me first

1. The **"LOAD SETUP DEFAULTS"** function loads the system default data directly from ROM and initializes the associated hardware properly. This function is necessary when you accept this mainboard, or the system CMOS data will corrupt.

```
                    ROM PCI/ISA BIOS
                   CMOS SETUP UTILITY
                  AWARD SOFTWARE, INC.
 ┌──────────────────────────────┬──────────────────────────────┐
 │ STANDARD CMOS SETUP          │ SUPERVISOR PASSWORD          │
 │ BIOS FEATURES SETUP          │ USER PASSWORD                │
 │ CHIPSET FEATURES SETUP       │ IDE HDD AUTO DETECTION       │
 │ POWER MANAGEMENT SETUP       │ HDD LOW LEVEL FORMAT         │
 │ PNP/PCI  CONFIGURA┌──────────────────────┐ ETUP            │
 │ INTEGRATED PERIPH │ Load SETUP Default (Y/N)? Y │ AVING    │
 │ LOAD SETUP DEFAULTS└──────────────────────┘                │
 ├──────────────────────────────┼──────────────────────────────┤
 │ ESC: QUIT                    │ ↑↓←→ :SELECT ITEM            │
 │ F10:Save & Exit Setup        │ (Shift)F2 :Change Color      │
 ├──────────────────────────────┴──────────────────────────────┤
 │        Load Setup Defaults Except Standard COMS SETUP        │
 └──────────────────────────────────────────────────────────────┘
```

LOAD SETUP DEFAULT

Contents

Package Checklist

Please check your package which should include all items listed below.
If you find any item damaged or missed, please contact your supplier.

- One mainboard
- One manual
- One IDE ribbon cable
- One floppy ribbon cable
- One AGP driver diskette
- One Ultra_DMA IDE driver diskette
- One Audio driver CD title(optional)

Chapter 1
Introduction

This mainboard is a high performance system hardware based on Intel Pentium processor and is equipped with three PCI slots, two standard ISA slots, Super Multi-I/O controller and dual port PCI-IDE connectors for the future expansion. The hardware dimension is 243mm x 190mm micro ATX form factor with a four-layer-design technology.

Specification

- VIA Apollo VPX/97 PCI set chipset.

- Intel **Pentium**®Processor, AMD K5/K6 , Cyrix 6x86L/6x86MX & idt C6 operating at **120 ~ 333 MHz** and **P55C** with **321 ZIF socket** 7 and scalability to accept faster Processors in the future.

- Supports up to 256 MegaBytes of DRAM (a minimum of 8 MB) on board (168-pin DIMM x 2). BIOS will automatically detect and configure FP/EDO and Synchronous DRAM.

- Supports 512KB Onboard Pipelined Burst (synchronous) L2 **Cache**.

- Supports two 16 bit ISA slots and three 32 bit PCI slots and provides two independent high performance PCI IDE interfaces capable of supporting **PIO Mode 3/4 and Ultra-DMA33** devices. This mainboard supports four PCI Bus Masters and a jumperless PCI INT# control scheme which reduces configuration confusion when plugging in PCI I/O controller card(s).

- Supports **ATAPI** (e.g. **CD-ROM**) devices on both IDE interfaces.

- Supports 1 floppy port, 1 parallel port (EPP,ECP port), 2 serial ports (16550 Fast UART compatible) and dual USB ports .

- Supports a **PS/2** style mouse and keyboard connectors.

- Supports Award Plug & Play BIOS . The BIOS is stored in Flash EPROM form. It provides better upgradeability for the system.

- Supports CPU Hardware sleep and SMM (System Management Mode).

- **This mainboard** utilizes Lithium battery which provides environmental protection and longer battery life.

- Supports an ATX power connector for a Remote On/Off, a Phone Ring Power On and Wake-up On LAN function.

Chapter 2
Hardware design

2-1 Mainboard Layout

This mainboard is designed with VIA Apollo VPX/97 PCIset chipset which is developed by VIA Corporation to fully support Pentium®Processor PCI/ISA system. The chipset provides an integrated IDE controller with two high performance IDE interfaces for up to four IDE devices (hard devices, CD-ROM device, etc). The Winbond W83877TF Super I/O controller provides the standard PC I/O function: one floppy interface, two 16 Byte FIFO serial ports and one EPP/ECP capable parallel port. This mainboard layout is shown in the next page for user's reference. **Care must be taken** when inserting memory modules, CPUs or even plugging PCI card into associated slots to avoid damaging any circuits or sockets on board. A cooling fan is strongly recommended when installing Pentium/Pentium MMX/K5/K6/6x86L/6x86MX/C6 processor due to possible overheat

This mainboard supports a minimum of 8MB and a maximum of 256MB of System Memory while Onboard 512KB cache to increase system performance.

This mainboard supports standard Fast Page, EDO (Extended Data Out or Hyper Page Mode) or synchronous DRAM. **This mainboard** provides two 168-pin DIMM sites for memory expansion. The sockets support 1M x 64(8MB), 2M x 64 (16MB), 4M x 64(32MB), and 8M x 64(64MB) single-sided or double-sided memory modules. The memory timing requires 70 ns Fast page devices or 60 ns EDO DRAM (DRAM Modules may be parity [x 36] or non-parity [x 32]

This mainboard supports **two Onboard PCI IDE** connectors, and automatically detects IDE harddisk type by BIOS utility automatic

This mainboard supports Award Plug & Play BIOS for the ISA and PCI cards. The BIOS can be located in Flash EPROM which can replace BIOS code easily if necessary
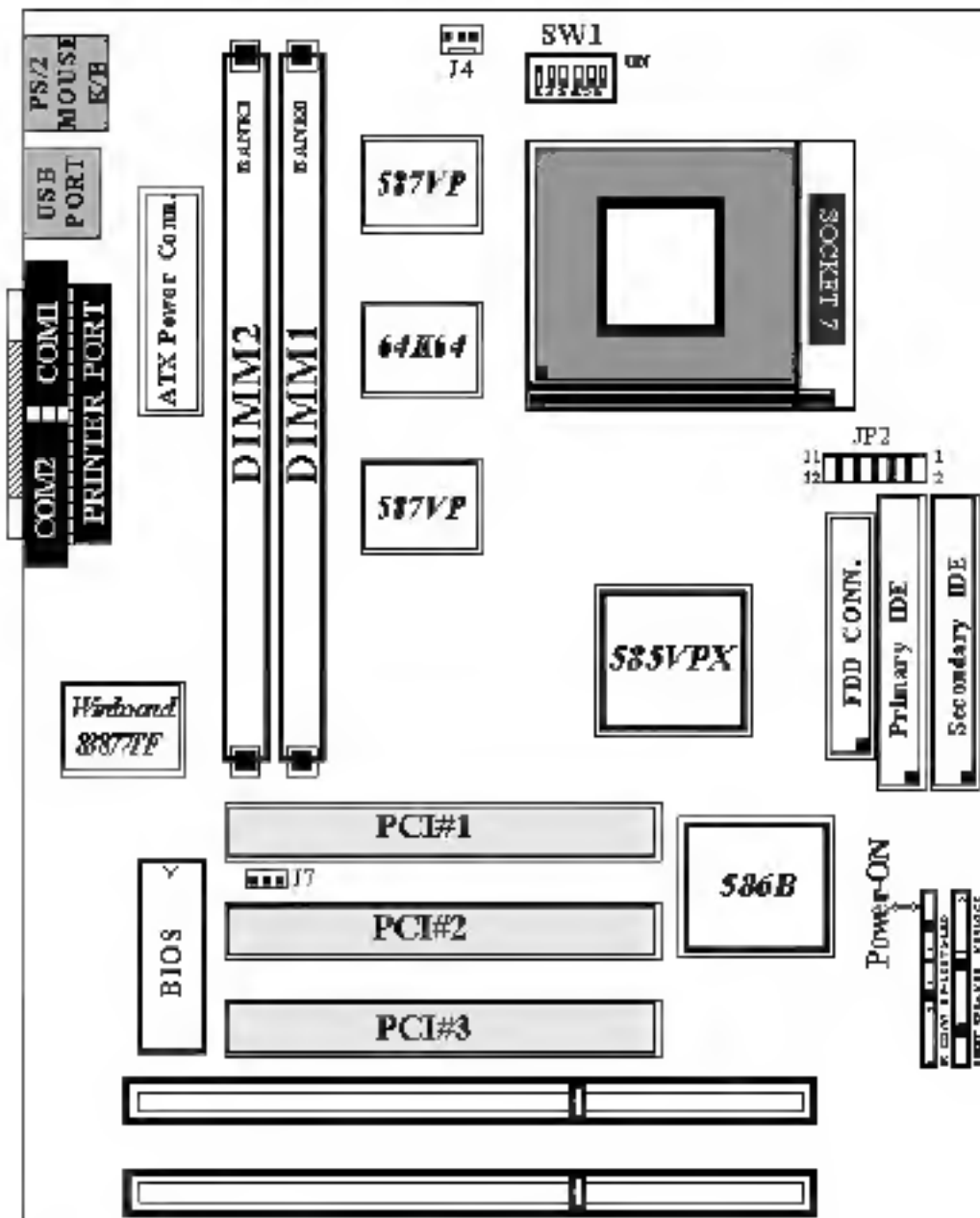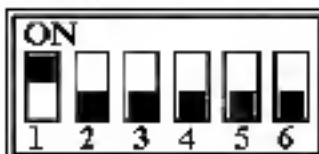
EP-51VPXC Layout

Figure 2-1

Note : SW1 setting

ON ▮ : Means ON

ON ▯ : Means OFF

2-2 Connectors and Jumpers

This section describes the connectors, jumpers and switch equipped in the mainboard. Please refer to <u>Figure 2-1</u> for the location of each connector and jumper.

SW1 : CPU Selection						*idt* C6 Pentium MMX AMD K5 / K6	Bus Freqency x Multiplier	Cyrix & IBM 6x86(L) / 6x86MX
1	**2**	**3**	**4**	**5**	**6**			
<u>ON</u>	OFF	OFF	<u>ON</u>	OFF	OFF	120MHz	60MHz x 2	6x86L-PR150
			OFF	OFF	OFF	133MHz	66MHz x 2	6x86/L/MX-PR166
			OFF	<u>ON</u>	<u>ON</u>		75MHz x 2	6x86/L/MX-PR200
			<u>ON</u>	OFF	<u>ON</u>		83MHz x 2	6x86MX-PR233
<u>ON</u>	<u>ON</u>	OFF	<u>ON</u>	OFF	OFF	150MHz	60MHz x 2.5	6x86MX-PR166
			OFF	OFF	OFF	166MHz	66MHz x 2.5	6x86MX-PR200
			OFF	<u>ON</u>	<u>ON</u>	188MHz	75MHz x 2.5	6x86MX-PR233
			<u>ON</u>	OFF	<u>ON</u>	208MHz	83MHz x 2.5	∗ 6x86MX-PR266
OFF	<u>ON</u>	OFF	<u>ON</u>	OFF	OFF	180MHz	60MHz x 3	
			OFF	OFF	OFF	200MHz	66MHz x 3	∗ 6x86MX-PR333
			OFF	<u>ON</u>	<u>ON</u>	225MHz	75MHz x 3	∗ 6x86MX-PR266
OFF	OFF	OFF	OFF	OFF	OFF	233MHz	66MHz x 3.5	∗ 6x86MX-PR266
<u>ON</u>	OFF	<u>ON</u>				∗ 266MHz	66MHz x 4	
<u>ON</u>	ON	ON				∗ 300MHz	66MHz x 4.5	
OFF	<u>ON</u>	<u>ON</u>				∗ 333MHz	66MHz x 5	

∗   *These settings are reserved for the future CPUs versions. When the future CPUs are ready and suitable for this mainboard, these settings will be correctly updated.*

JP2 : CPU Vcore voltage selection :

11-12 : 3.5V for Pentium, AMD K5, Cyrix 6x86 and *idt* C6

9-10 : 3.2V for AMD K6-PR2-233

7-8 : 2.9V for AMD K6-PR2-166/200 and Cyrix 6x86MX

5-6 : 2.8V for Pentium MMX and Cyrix 6x86L

3-4 : 2.2V for AMD K6 3D CPUs

1-2 : 2.1V Reserved

J2   **KeyLock** - Keyboard lock switch & Power LED connector.

5   5. GND
    4. Key-Lock
    3. GND
    2. N/C
1   1. Power LED(+)

Speaker - connect to the system's speaker for beeping.

4   4 VCC
    3. GND
    2. N/C
1   1. Speaker

Reset Switch - Closed to restart system.

J3

Power-ON-Push the button to turn on the system.
          -Pressing less than 4 seconds to enter the suspend mode
          -Pressing more than 4 seconds to turn off the system

Turbo LED indicator - LED ON when higher speed is selected
There is no deturbo function so that the turbo LED is always ON.

+

IDE LED indicator - LED ON when harddisks activate.

+

IrDA/ASK IR CONNECTOR

5   5. IRTX
    4. GND
    3 IRRX
    2 N/C
    1 VCC

J4   **CPU FAN Connector**

**J7**   **WOL(Wake-up On Lan) Connector**

2-3 System Memory Configuration

This mainboard supports different type of settings for the system memory. The following figures and table provides all possible memory combinations.

DIMM2		> BANK 1
DIMM1		> BANK 0

DIMM1 (BANK 0)	DIMM 2 (BANK 1)	TOTAL MEMORY SIZE
8MB 16MB 32MB 64MB 128MB x1	8MB 16MB 32MB 64MB 128MB x1	MAX = 256MB

NOTE 1 : The KEY ZONE of the DIMM socket is 3.3V/Unbuffered.

DRAM chip

LEFT KEYZONE
(Unbuffered DRAM)

CENTER KEYZONE
(3.3V DRAM)
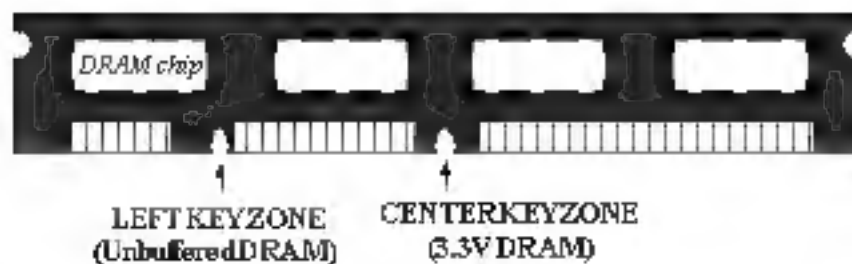
2-4 Integrated PCI Bridge

The **EP-51VPXC** utilizes **VIA Apollo VPX/97 PCIset** chipset to support Intel Pentium Processor PCI/ISA system. The VIA Apollo VPX/97 PCIset chipset consists of the 82C585VPX AT system controller (TSC), and one 82C586B PCI ISA IDE Accelerator bridge chip. It provides an interface which translates CPU cycle into PCI bus cycle, and PCI burst read/write capability. In addition, it provides high performance PCI arbitor to support four PCI Masters, Rotating Priority Mechanism and Hidden Arbitration Scheme Minimizes Arbitration Overhead.

There are four interrupts in each PCI slot: INTA#, INTB#, INTC#, and INTD#. Since this mainboard adapts the PCI auto-configuration with the system BIOS Setup utility. When the system is turned on after adding a PCI add-in card, the BIOS automatically configure interrupts, DMA channels, I/O space, and other paramaters. You do not have to configure jumpers or worry about potential resource conflicts. Because PCI cards use the same interrupt resource as ISA cards, you must specify the interrupt used by ISA add-in cards in the BIOS Setup utility.

However, if a "Legacy card" such as plugging a paddle card and cable into an ISA slot happen in the system, modification in the **ROM SETUP UTILITY** become necessary. First of all, you must enter **PCI CONFIGURATION SETUP** utility from the **ROM SETUP UTILITY** main menu to set 'ISA' for the '**PCI IDE IRQ MAP TO**'.

Secondly, you must enter the **CHIPSET FEATURES SETUP UTILITY** from the **ROM SETUP UTILITY** main menu, and set "Disabled" for the '**Onboard Primary PCI IDE**' and the **Onboard Secondary PCI IDE**'. When you plug PCI/ISA IDE cards into the system, You should select "Disabled" for the **Onboard Primary and Secondary PCI IDE** from the **CHIPSET FEATURES SETUP UTILITY** too.

You can set the system interrupt request (IRQ) on some "Legacy cards" which have or particular card(and that are inserted the instruction manual on the card) to a proper system IRQ level. In general, card's Primary is assigned to INTA and Secondary is assigned to INTB. If the card is plugged into a first marked PCI# , you cannot use second slot (marked PCI#2) because the Secondary INT signal take INTB from the first interrupt of page 3-2 for circuit diagram). The user then enters the **PCI CONFIGURATION SETUP** utility from the **ROM SETUP UTILITY** main menu, and set "PCI Slot 1" for the '**PCI IDE IRQ MAP TO**'(This depends on the slot # where the Legacy card is plugged).

CHAPTER 3
AWARD BIOS SETUP

Award's ROM BIOS provides a built-in setup program which allows user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS RAM so data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stays unchanged unless there is a configuration change in the system, such as a hard drive replacement or a new device installation.

If this does happen you will need to reconfigure your configuration parameter.

To Enter Setup Program

Power on the computer and press <Del> key immediately. This will bring you into BIOS **CMOS SETUP UTILITY**.

```
                    ROM PCI/ISA BIOS (2A5LDPAB)
                         CMOS SETUP UTILITY
                       AWARD SOFTWARE, INC.

    STANDARD CMOS SETUP             SUPERVISOR PASSWORD
    BIOS FEATURES SETUP             USER PASSWORD
    CHIPSET FEATURES SETUP          IDE HDD AUTO DETECTION
    POWER MANAGEMENT SETUP          HDD LOW LEVEL FORMAT
    PNP/PCI CONFIGURATION           SAVE & EXIT SETUP
    INTEGRATED PERIPHERALS          EXIT WITHOUT SAVING
    LOAD SETUP DEFAULTS

    ESC : QUIT                      ↑ ↓ → ←    SELECT ITEM
      F10    Save & Exit Setup      (Shift)F2   Change Color

                    Time, Date, Hard Disk Type
```

Figure 3-1 CMOS SETUP UTILITY

The menu displays all major selection items. Select the item you need to reconfigure. The selection is made by moving cursor (press any direction key) to the item and press the Enter key. An on-line help message is displayed at the bottom of the screen as the cursor is moving to various items which provides a better understanding of each function. When a selection is made, the menu of selected item will appear so the user can modify the associated configuration parameters.

3-1 STANDARD CMOS SETUP

Choose "STANDARD CMOS SETUP" in the CMOS SETUP UTILITY Menu (Fig. 3-1). The STANDARD CMOS SETUP allows user to configure system setting such as the current date and time, type of hard disk drive installed, floppy drive type, and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted, use direction keys to move cursor and <Enter> key to select), the entries in the field will be changed by pressing <PgDn> or <PgUp> keys or user can enter new data directly from the keyboard.

```
            ROM PCI/ISA BIOS(2A5LDPAB)
               STANDARD CMOS SETUP
               AWARD SOFTWARE, INC.

 Date (mm:dd:yy)  Wed Apr 17 996
 Time (hh:mm:ss)  14  30  30

 HARD DISKS       TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDZONE  SECTORS  MODE
 Primary Master   Auto   0     0     0       0        0         0     Auto
 Primary Slave    Auto   0     0     0       0        0         0     Auto
 Secondary Master Auto   0     0     0       0        0         0     Auto
 Secondary Slave  Auto   0     0     0       0        0         0     Auto

 Drive A   1.44M,3.5in
 Drive B   None                      Base Memory        640K
 Floppy 3 mode Support  Disable      Extended Memory  15360K
 Video     EGA/VGA                   Other Memory       384K
 Halt On   All Errors
                                       Total Memory   16384K

 ESC   Quit            ↑ ↓ → ←   Select Item      PU/PD/+/-  Modify
 F1    Help            Shift F2   Change Color
```

Figure 3-2 STANDARD CMOS SETUP

NOTE: If the hard disk Primary Master/Slave and the Secondary Master/Slave are set as "Auto", then the hard disk size and model will be auto-detected.

NOTE: The "Halt On " field is to determine when to halt the system by the BIOS if an error occurs.

3-2 BIOS FEATURES SETUP

Selecting the "BIOS FEATURES SETUP" option in the CMOS SETUP UTILITY menu allows user to change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values of this mainboard. Again, user can move the cursor by pressing direction keys and <PgDn> or <PgUp> keys to modify the parameters. Pressing F1 key to display help message of the selected item.

This setup program also provides 2 convenient ways to load the default parameter data from BIOS[F6] or CMOS[F7] area if shown data is corrupted. This provides the system a capability to recover from any possible error.

```
              ROM PCI/ISA BIOS(2A5LDPAB)
                   BIOS FEATURES SETUP
                  AWARD SOFTWARE, INC.

 Virus Warning            Disabled      Video BIOS      Shadow      Enabled
 CPU Internal Cache       Enabled       C8000-CBFFF     Shadow      Disabled
 External Cache           Enabled       CC000-CFFFF     Shadow      Disabled
 Quick Power On Self Test Enabled       D0000-D3FFF     Shadow      Disabled
 Boot Sequence            A, C          D4000-D7FFF     Shadow      Disabled
 Swap Floppy Drive        Disabled      D8000-DBFFF     Shadow      Disabled
 Boot Up Floppy Seek      Enabled       DC000-DFFFF     Shadow      Disabled
 Boot Up NumLock Status   On
 Boot Up System Speed     High
 Gate A20 Option          Fast
 Typematic Rate Setting   Disabled
 Typematic Rate (Chars/Sec) 6
 Typematic Delay (Msec)   250
 Security Option          Setup       Esc  Quit           ↑↓ → ← Select  Item
 PCI/VGA Palette Snoop    Disabled    F1   Help           PU/PD/+/-  Modify
 OS Select For DRAM > 64MB Non-OS2    F5   Old Values     Shift)F2   Color
                                      F7   Load Setup Defaults
```

Figure 3-3 BIOS FEATURES SETUP

Note The **Security Option** contains **"setup"** and **"system"** The **"setup"** indicates that the password setting is for CMOS only while the **"system"** indicates the password setting is for both CMOS and system boot up

- **Virus Warning** This category flashes on the screen During and after the system boots up any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and an error message will appear You should then run an anti-virus program to locate the virus Keep in mind that this feature protects only the boot sector not the entire hard drive Default value is Disabled

  Enabled Activates automatically when the system boots up causing a warning message to appear when any attempt to access the boot sector or hard disk partition table

  Disabled: No warning message to appear when any attempt to access the boot sector or hard disk partition table

- **CPU Internal Cache External Cache**: These two categories speed up memory access However it depends on CPU chipset design The default value is Enabled If your CPU is without Internal Cache then this item "CPU Internal Cache" will not be shown

  Enabled: Enable cache

  Disable Disable cache

- **Quick Power On Self Test.** This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some checking items during POST.
  Enabled: Enable quick POST
  Disabled: Normal POST

- **Boot Sequence**: This category determines which drive is searched first for the O/S (Operating System). The default value is A,C.
  A,C: The system will search for floppy disk drive first then hard disk drive
  C,A: The system will search for hard disk drive first then floppy disk drive

- **Swap Floppy Drive**: This will swap your physical drive letters A&B if you are using two floppy disks. The default value is Disabled.
  Enabled: Floppy A & B will be swapped under the O/S
  Disabled: Floppy A & B will be not swapped

- **Boot Up Floppy Seek**: During Power-On Self Test (POST), BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. Only 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks. The default value is Enabled.
  Enabled: BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks.
  Note that BIOS cannot tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks
  Disabled: BIOS will not search for the type of floppy disk drive by track number.
  Note that there will not be any warning message if the drive installed is 360K.

- **Boot Up NumLock Status**: The default value is On.
  On: Keypad is number keys
  Off: Keypad is arrow keys

- **Boot UP System Speed**: Select default system speed. The system will run at the selected speed after the system boots.
  High: Set the speed to high
  Low: Set the speed to low

- **Gate A20 Option**: This refers to the way the system addresses memory above 1MB (extended memory). The default value is Fast.
  Normal: The A20 signal is controlled by keyboard controller or chipset hardware
  Fast: The A20 signal is controlled by Port 92 or chipset specific method

- **Typematic Rate Setting**: This determines the typematic rate
  Enabled: Enable typematic rate and typematic delay programming
  Disabled: Disable typematic rate and typematic delay programming. The system BIOS will use default value of 2 items and the default is controlled by the keyboard

- **Typematic Rate(Chars/Sec)**:

6: 6 characters per second.	8: 8 characters per second.
10: 10 characters per second	12: 12 characters per second.
15: 15 characters per second.	20: 20 characters per second.
24: 24 characters per second.	30: 30 characters per second.

- **Typematic Delay(Msec)**: This determines the time between the first and second character displayed, when holding a key
  250: 250msec
  500: 500msec
  750: 750msec
  1000: 1000msec

- **Security Option**: This category allows you to limit access to the system and Setup, or just to Setup. The default value is Setup
  System: The system will not boot and the access to Setup will be denied if the correct password is not entered at the prompt
  Setup: The system will boot, but the access to Setup will be denied if the correct password is not entered at the prompt

- **PCI/VGA Palette Snoop**: This filed controls the ability of a primary PCI VGA controller to share a common palette (when a snoop write cycles) with an ISA video card. The default value is Disabled
  Enabled: If an ISA card connects to a PCI VGA card via the VESA connector and the ISA card connects to VGA monitor and uses the RAMDAC of PCI card, the PCI/VGA Palette Snoop is enabled
  Disabled: Disable the VGA card Palette snoop function

- **Video BIOS Shadow**: It determines whether video BIOS will be copied to RAM, however it is optional from chipset design. Video Shadow will increase the video speed
  Enabled: Video shadow is enabled.
  Disabled: Video shadow is disabled.

- C8000 CBFFF Shadow
  CC000 CFFFF Shadow
  D0000 D3FFF Shadow
  D4000 D7FFF Shadow
  D8000 DBFFF Shadow
  DC000 DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per unit and the size depends on the chipset.

Enabled   Optional shadow is enabled.

Disabled Optional shadow is disabled.

3-3 CHIPSET FEATURES SETUP

Choose the "**CHIPSET FEATURES SETUP**" in the **CMOS SETUP UTILITY** menu to display the following menu.

```
          ROM PCI/ISA  BIOS(2A5LDPAB)
             CHIPSET FEATURES SETUP
             AWARD SOFTWARE, INC.

DRAM Auto Configuration      60 ns
DRAM Timing Control          Auto
Video BIOS Cacheable         Enabled
System BIOS Cacheable        Disabled
Memory Hole A  5Mb Addr      Disabled
Fast DRAM Decoding           Disabled
Sustained 9T Write           Enabled
2 Bank PBSRAM                ? 1
Read Pipeline                Enabled
Write Pipeline               Enabled
Cache Timing                 Fast
Linear Burst                 Disabled
SDRAM Cycle Length           2
SDRAM Bank Interleave        Disabled

                                         Esc  Quit           ↑↓ ← →  Select Item
                                         F1   Help           PU/PD/+  Modify
                                         F5   Old Values     (Shift)F2  Color
                                         F7   Load Setup Defaults
```

Figure 3-4   CHIPSET FEATURES SETUP

Note   When you insert slower memory modules in the system and set a faster timing, maybe the system will hang up.

- **DRAM Timing**: The default value is 60ns

  60ns   2 (faster) Burst Wait State for 60-70ns Fast Page Mode/EDO DRAM

  70ns   3 (slower) Burst Wait State for 70ns Fast Page Mode/EDO DRAM

- **Video BIOS Cacheable:** The default value is Enabled

  Enabled   Enabled the Video BIOS Cacheable to speed up the VGA Performance

  Disabled: Disabled the Video BIOS Cacheable function.

- **Memory Hole at 15M-16M**: The default value is Disabled

  Disabled: Normal Setting.

  Enabled   This field enableds the main memory 15-16MB remap to ISA BUS

3.4 POWER MANAGEMENT SETUP

Choose the **"POWER MANAGEMENT SETUP"** in the CMOS SETUP UTILITY to display the following screen. This menu allows the user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it is absolutely necessary.

```
                      ROM PCI/ISA BIOS
                 POWER MANAGEMENT SETUP
                   AWARD SOFTWARE, INC.

 Power Management      User Define    ** Power Down & Resume Events **
 PM Control by APM     Yes            IRQ5   (LPT 2)        Primary
 Video off Option      Suspend -> Off IRQ6   (Floppy Disk)  Disabled
 Video off Method      V/H SYNC+Blank IRQ7   (LPT 1)        Primary
   Conserve Mode       Disabled       IRQ8   (RTC Alarm)    Disabled
 Modem Use IRO         3              IRQ9   (IRQ2 Redir)   Primary
     ** PM Timers **                  IRQ10  (Reserved)     Primary
 HDD Power Down        Disable        IRQ11  (Reserved)     Primary
 Doze Mode             Disable        IRQ12  (PS/2 Mouse)   Primary
 Suspend Mode          Disable        IRQ13  (Coprocessor)  Primary
                                      IRQ14  (Hard Disk)    Primary
   ** PM Events **                    IRQ15  (Reserved)     Disabled
 VGA                   OFF
 LPT & COM             LPT/COM
 HDD & FDD             OFF
 DMA /master           OFF            Esc  Quit        ↑↓→←   Select Item
 Primary INTR          ON             F1   Help        PU/PD+/- Modify
 IRQ3 (COM 2)          Primary        F5   Old Values  (Shift)F2 Color
 IRQ4 (COM )           Primary        F7   Load Setup Defaults
```

Figure 3-5 POWER MANAGEMENT SETUP

Again, user can move the cursor by pressing direction keys to the field needed to be modified and press <PgDn> or <PgUp> to alter item selection. You can only change the content of **Doze Mode**, **Standby Mode**, and **Suspend Mode** when the **Power Management** is set to **User Define**.

3.4.1 The Description of the Power Management

A. Power Management mode selection

Disabled   The system operates in NORMAL conditions (Non-GREEN) and the Power Management function is disabled.

Max. saving: This mode will maximize the power saving capability.

Min. saving: This mode will minimize the power saving capability.

User define: Allow user to define time out parameters to control power saving mode. Refer to item B shown below.

B. Time-out parameters

HDD Standby

HDD Standby timer can be set from   to   5 minute(s).

System Doze

The "System Doze" mode timer starts to count when there s no "PM events"
occurred. The valid time-out setting is from 1 minute up to 1 hour.

System Suspend

This function works only when the Pentium Processor is installed. The timer starts
to count when "System Standby" mode timer is timed out and no "PM Events"
occurred. Valid range is from   minute up to   hour.

3-4-2   Description of the Green Functions

This mainboard supports HDD Power Down, Doze and Suspend power saving functions.
In addition, the hardware suspend function is supported when the J3 Power On (Refer
to Figure 2-1 is closed to enter the Suspend function.
The detailed description of these functions is provided in the next page.

HDD Standby Mode

When system stops reading or writing HDD, the timer starts to count. The system will
cut off the HDD power when timer runs out of time. The system will not resume
operation until either a read from or a write to HDD command s executed again.

Doze Mode

The system hardware will drop down CPU clock from normal working speed
when Doze mode time-out occurs.

Suspend Mode

When the system suspend timer times out, the system will enter the suspend mode
and the chipset will stop CPU clock immediately. The power consumption in
Suspend Mode is lower than in standby mode. The screen is also blanked out.

PMEvents

AWARD BIOS defines 15 PM Events in the power management mode (Doze & suspend). The user can initialize any PM Events to be "Enable" or "Disable". When the system detects all of the enabled events do not have any activity. It will start the system Doze timer first if the "Power Management" is not "Disabled". Once the system Doze timer is timed out, it will process doze power saving procedure by starting the system suspend timer. When the suspend timer times out, all of the CPU clock will stop by dropping system clock down to zero and remains this way until any one of the "Enabled" event occurs.

3-5 PNP/PCI CONFIGURATION

The PNP/PCI configuration program is for the user to modify the PCI/ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots.

WARNING Any misp aring IRQ could cause system can't pick out the resources.

```
            ROM PCI/ISA BIOS(2A5LDPAB)
                PNP/PCI CONFIGURATION
                AWARD SOFTWARE, INC.

PNP installed           No         CPU to PCI Write Buffer    Enabled
Resource Controlled By  Manual     PCI Dynamic Bursting       Enabled
Reset Configuration Data Disabled  PCI Master 0 WS Write      Enabled
                                   PCI Peer Concurrency       Enabled
IRQ-3   assigned to   Legacy ISA   PCI Delay Transaction      Disabled
IRQ-4   assigned to   Legacy ISA
IRQ-5   assigned to   PCI/ISA PnP  PCI IRQ Actived By         Level
IRQ-7   assigned to   Legacy ISA   PCI IDE IRQ Map To         PCI-AUTO
IRQ-9   assigned to   PCI/ISA PnP  Primary   IDE INT#         A
IRQ-10  assigned to   PCI/ISA PnP  Secondary IDE INT#         B
IRQ-11  assigned to   PCI/ISA PnP
IRQ-12  assigned to   PCI/ISA PnP
IRQ-14  assigned to   Legacy ISA
IRQ-15  assigned to   Legacy ISA
DMA-0   assigned to   PCI/ISA PnP
DMA-1   assigned to   PCI/ISA PnP  ESC  Quit           ↑↓→←  Select Item
DMA-3   assigned to   PCI/ISA PnP  F1   Help           PU/PD/+  Modify
DMA-5   assigned to   PCI/ISA PnP  F5   No Change      (Shift) F2  Color
DMA-6   assigned to   PCI/ISA PnP  F7   Load Setup Defaults
DMA-7   assigned to   PCI/ISA PnP
```

Figure 3-6 PCI CONFIGURATION SETUP

* **Resource Controlled By** The default value is Manual.

  Manual The field defines that the PNP Card's resource is controlled by manual. You can set whether IRQ-X or DMA-X is assigned to PCI/ISA PNP or Legacy ISA Cards

  Auto: If your ISA card and PCI card are all PNP cards Set this field Auto. The BIOS will assign the interrupt resource automatically

* **Reset Configuration Data:** The default value is Disabled

  Disabled: Normal Setting

  Enabled If you plug some Legacuy cards in the system and record into ESCD (Extended System Configuration Data) You can set this field to be Enabled and to clear ESCD at one time, when some Legacy cards are removed.

* **PCI IDE IRQ Map To** The default value is PCI AUTO

  When you have true PCI card(s) plugged into the system, you will not need to change any thing here in the **SETUP** program. However, if you do not know whether you are using a true PCI card, please refer to your PCI card user's manual for the details

  When you have a Legacy card (described in section 2-5) to plug into the system, a proper setting is extremely important or it may cause the system hung up. The diagram shown below tells you how the Rotating Priority Mechanism is designed.
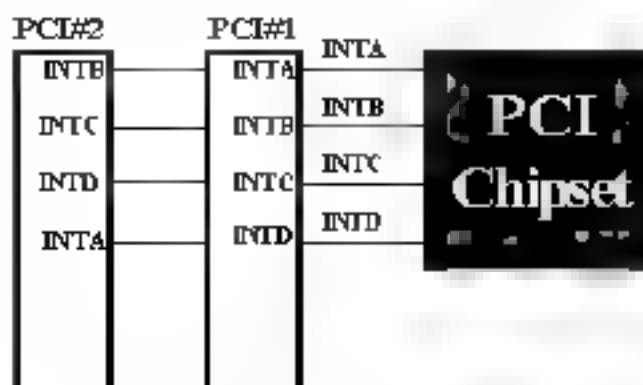

Figure 3-7 The Combination of PCI INT# lines

3-6 INTEGRATED PERIPHERALS

```
              ROM  PCI/ISA  BIOS(2A5LDPAB)
                  INTEGRATED PERIPHERALS
                  WARD   SOFTWARE, INC.

Onboard Primary PCI IDE       Enabled      Onboard Parallel Port       378/IRQ7
Onboard Secondary PCI IDE     Enabled      Onboard Parallel Mode       ECP EPP
IDE Prefetch Mode             Enabled      ECP Mode Use DMA            3
IDE HDD Block Mode            Enabled      Parallel Port EPP Type      EPP 9
IDE primary Master PIO        Auto
IDE Primary Slave PIO         Auto         Onboard USB Controller      Disabled
IDE Secondary Master PIO      Auto
IDE Secondary Slave PIO       Auto
IDE Primary Master UDMA       Auto
IDE Primary Slave UDMA        Auto
IDE Secondary Master UDMA     Auto
IDE Secondary Slave UDMA      Auto
PCI IDE Secondary Channel     Enabled
Onboard FDC Controller        Enabled     ESC   Quit        ↑↓ → ←    Select Item
UART 2 Mode                   Standard    F1    Help        PU/PD/+/-  Modify
                                          F5    No Change   Shift F2   Color
                                          F7    Load Setup Defaults
```

Note: If you don t use the Onboard IDE connector, then use On-card
(PCI or ISA card) IDE connector You have to set Onboard Primary
PCI IDE: Disabled and Onboard Secondary PCI IDE: Disabled
from CHIPSET FEATURES SETUP UTILITY
The Onboard PCI IDE cable should be **equal to or less than**
18 inches (45 cm.).

- **IDE HDD Block Mode**: The default value s Enabled.
  Enabled   Enabled IDE HDD Block Mode The HDD transfer rate is better than
                Disable
  Disabled: Disable IDE HDD Block Mode

♦ **PCI Slot IDE 2nd Channel**: The default value is Enabled
  Enabled   Enable secondary IDE port and BIOS will assign IRQ 5 for this port
  Disabled Disable secondary IDE port and IRQ15 is available for other device

♦ **Onboard Primary PCI IDE** The default value is Enabled.
  Enabled   Enable Onboard st channel IDE port
  Disabled Disable Onboard 1st channel IDE port When use On-card (PCI or ISA
                card) IDE connector

- **Onboard Secondary PCI IDE** The default value is Enabled
  Enabled   Enable Onboard 2nd channel IDE port
  Disabled Disable Onboard 2nd channel IDE port When use On-card (PCI or ISA
                card IDE connector

- **IDE Primary Master PIO** The default value is Auto

    Auto   BIOS will automatically detect the Onboard Primary Master PCI
                     IDE HDD Accessing mode
    Mode 0~4   Manually set the IDE Accessing mode

- **IDE Primary Slave PIO** The default value is Auto

    Auto   BIOS will automatically detect the Onboard Primary Slave PCI IDE
                     HDD Accessing mode
    Mode 0~4   Manually set the IDE Accessing mode

- **IDE Secondary Master PIO** The default value is Auto

    Auto   BIOS will automatically detect the Onboard Secondary Master PCI
                     IDE HDD Accessing mode
    Mode 0~4   Manually set the IDE Accessing mode

- **IDE Secondary Slave PIO** The default value is Auto

    Auto   BIOS will automatically detect the Onboard Secondary Slave PCI
                     IDE HDD Accessing mode
    Mode 0~4   Manually set the IDE Accessing mode

- **Onboard FDC Controller** The default value is Enabled

    Enabled   Enable the Onboard floppy drive interface controller
    Disabled   Disable the Onboard floppy drive interface controller
                     When using On card ISA FDC's controller

- **Onboard UART 1** This field allows the user to select the serial port. The default
    value is 3F8H/IRQ4
    COM1 Enable Onboard Serial port 1 and address is 3F8H/IRQ4
    COM2 Enable Onboard Serial port 1 and address is 2F8H/IRQ3
    COM3 Enable Onboard Serial port 1 and address is 3E8H/IRQ4
    COM4 Enable Onboard Serial port 1 and address is 2E8H/IRQ3
    Disabled: Disable Onboard Serial port 1

- **Onboard UART 2** This field allows the user to select the serial port. The default
    value is 2F8H/IRQ3
    COM1 Enable Onboard Serial port 2 and address is 3F8H/IRQ4
    COM2 Enable Onboard Serial port 2 and address is 2F8H/IRQ3
    COM3 Enable Onboard Serial port 2 and address is 3E8H/IRQ4
    COM4 Enable Onboard Serial port 2 and address is 2E8H/IRQ3
    Disabled: Disable Onboard Serial port 2

- **Onboard UART 2 Mode**: The default value is standard. This field allows the User to select the COM2 port that can support a serial Infrared Interface
  Standard: Support a Serial Infrared Interface IrDA
  HPSIR: Support a HP Serial Infrared Interface format
  ASKIR   Support a Sharp Serial Infrared Interface format

- **Onboard Parallel port**: This field allows the user to select the LPT port. The default value is 378H/IRQ7

378H	Enable Onboard LPT port and address is 378H and IRQ7
278H	Enable Onboard LPT port and address is 278H and IRQ5
3BCH	Enable Onboard LPT port and address is 3BCH and IRQ7
Disabled	Disable Onboard LPT port

  NOTE Parallel Port address is 378H/3BCH that selects the rounting of IRQ7 for LPT1.
      Parallel Port address is 278H that selects the rounting of IRQ5 for LPT1.

- **Parallel port Mode** This field allows the user to select the parale port mode The default value is ECP+EPP

Normal	Standard mode IBM PC AT Compatible bidirectional parale port
EPP	Enhanced Parallel Port mode
ECP	Extended Capability Port mode
EPP+ECP	ECP Mode & EPP Mode

  ECP Mode USE DMA This field allows the user to select DMA1 or DMA3 for the ECP mode The default value is DMA3

DMA1	The field selects the rounting of DMA1 for the ECP mode
DMA3	The field selects the rounting of DMA3 for the ECP mode

3-7   LOAD SETUP DEFAULTS

The "**LOAD SETUP DEFAULTS**" function loads the system default data directly from ROM and initializes the associated hardware properly This function will be necessary only when the system CMOS data is corrupted.
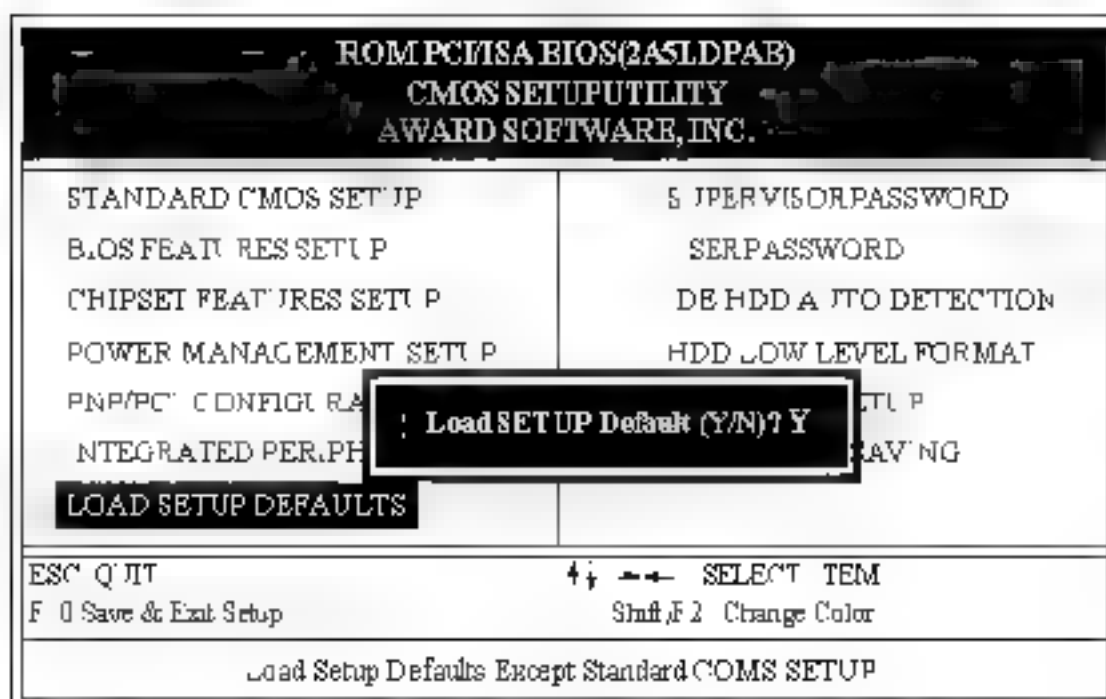
```
             ROM PCI/ISA BIOS(2A5LDPAB)
                 CMOS SETUP UTILITY
                AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP          SUPERVISOR PASSWORD

   BIOS FEATURES SETUP          USER PASSWORD

   CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION

   POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT

   PNP/PCI CONFIGURA       Load SETUP Default (Y/N)? Y   TUP

   INTEGRATED PERIPH                              SAVING

   LOAD SETUP DEFAULTS

   ESC: QUIT                      ↑↓ →←   SELECT ITEM
   F10 Save & Exit Setup         Shift/F2   Change Color

         Load Setup Defaults Except Standard COMS SETUP
```

Figure 3-8 LOAD SETUP DEFAULT

3-8   CHANGE SUPERVISOR or USER PASSWORD

To change the password, choose the **'SUPERVISOR PASSWORD or USER PASS-WORD'** option from the **CMOS SETUP UTILITY** menu and press ,Enter

NOTE   Either **'Setup'** or **'System'** must be selected in the **'Security Option'** of the **BIOS FEATURES SETUP** menu (Refer to Figure 3-3 for the details

1   If CMOS is corrupted or the option is not used, a default password stored in the ROM will be used The screen will display the following message

```
                   Enter Password:
```

Press the [Enter] key to continue after proper password is given

2   If CMOS is corrupted or the option was used earlier and the user wish to change default password, the **SETUP UTILITY** will display a message and ask for a confirmation

```
                   Confirm Password:
```

3   After pressing the [Enter] key (ROM password if the option was not used' or current password user-defined password) the user can change the password and store new one in CMOS RAM A maximum of 8 characters can be entered.

3.9 IDE HDD AUTO DETECTION

The "IDE HDD AUTO DETECTION" utility is a very useful tool especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type installed in the system automatically. **But now** you can set **HARD DISK TYPE** to **Auto** in the **STANDARD CMOS SETUP**. You do not need the "IDE HDD AUTO DETECTION" utility. The BIOS will Auto- detect the hard disk size and model on display during POST.
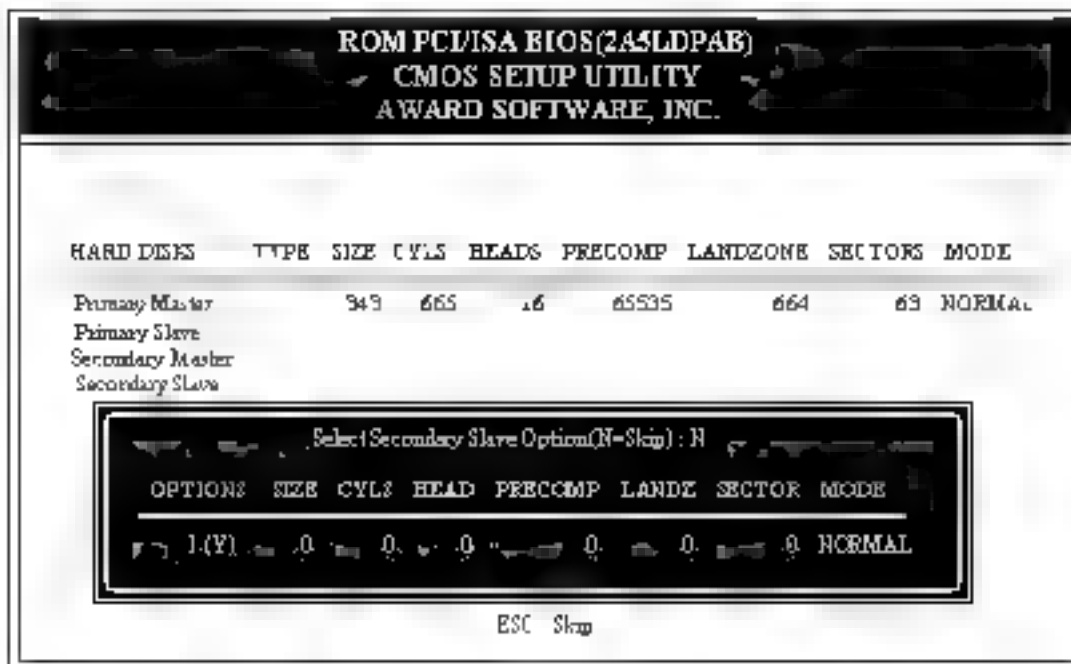


```
             ROM PCI/ISA BIOS(2A5LDPAB)
               CMOS SETUP UTILITY
             AWARD SOFTWARE, INC.


HARD DISKS    TYPE  SIZE  CYLS  HEADS  PRECOMP  LANDZONE  SECTORS  MODE

Primary Master        349   665    16    65535      664       63  NORMAL
Primary Slave
Secondary Master
Secondary Slave

        ┌──────── Select Secondary Slave Option(N=Skip) : N ────────┐
        │ OPTIONS   SIZE  CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE   │
        │                                                           │
        │   1(Y)     0     0     0       0       0      0    NORMAL  │
        └───────────────────────────────────────────────────────────┘

                          ESC : Skip
```

Figure 3-9 IDE HDD AUTO DETECTION

NOTE: HDD Modes

The Award BIOS supports 3 HDD modes : NORMAL, LBA and LARGE.

NORMAL mode

Generic access mode that is neither the BIOS nor the IDE controller will make transformations during accessing.

The maximum numbers of cylinders, head & sectors for NORMAL mode are 1024, 16 and 63.

$$
\begin{array}{ll}
\text{no. Cylinder} & (1024) \\
\times \ \text{no. Head} & (16) \\
\times \ \text{no. Sector} & (63) \\
\times \ \text{no. per sector} & (512) \\
\hline
& 528 \text{ Megabytes}
\end{array}
$$

If user sets this HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that.

LBA (Logical Block Addressing) mode   This is a new HDD accessing method to overcome the 528 Megabyte bottleneck.

The number of cylinders, heads and sectors shown in the setup may not be the number physically contained in the HDD.

During the HDD accessing, the IDE controller will transform the logical address described by sector, head and cylinder into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 8.4 Gigabytes which is obtained by the following formula:

$$
\begin{array}{lr}
\text{no. Cylinder} & (1024) \\
\text{x no. Head} & 255) \\
\text{x no. Sector} & 63) \\
\text{x bytes per sector} & 512) \\
\hline
8.4 \text{ Gigabytes}
\end{array}
$$

LARGE mode   This is an extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinders without LBA support (in some cases, user does not want LBA). The Award BIOS provides another alternative to support these kinds of LARGE mode.

CYLS.	HEADS	SECTOR	MODE
120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT 12h in order to access the right HDD address.

Maximum HDD size:

$$
\begin{array}{lr}
\text{no. Cylinder} & (1024) \\
\text{x no. Head} & 32) \\
\text{x no. Sector} & 63) \\
\text{x bytes per sector} & 512) \\
\hline
1 \text{ Gigabytes}
\end{array}
$$

Note

To support LBA or LARGE mode of HDDs there must be some softwares involved All softwares are located in the Award HDD Service Routine INT 3h It may fail to access a HDD with LBA (LARGE) mode selected if you are running under on Operating System which replaces the whole INT 3h UNIX operating systems do not support either LBA or LARGE and must utilize the Standard mode UNIX can support drives larger than 528MB

3-10 HDD LOW LEVEL FORMAT

Interleave

Select the interleave number of the hard disk drive that you wish to perform a low level format on You may select from 1 to 8 Check the documentation that came with the drive for the correct interleave number or select 0 for automatic detection

Auto scan bad track

This allows the utility to scan first then format by each track

Start

Press <Y> to start low level format

3-11 SAVE & EXIT SETUP

The "SAVE & EXIT SETUP" option will bring you back to boot up procedure with all the changes you just recorded in the CMOS RAM

3-12 EXIT WITHOUT SAVING

The "EXIT WITHOUT SAVING" option will bring you back to normal boot up procedure without saving any data into CMOS RAM All old data in the CMOS will not be destroyed

Chapter 4
Technical Information

4-1 I/O & MEMORY MAP

MEMORY MAP

Address Range	Size	Description
[00000-7FFFF]	512K	Conventional memory
[80000-9FBFF]	127K	Extended Conventional memory
[9FC00-9FFFF]	1K	Extended BIOS data area if PS/2 mouse is installed
[A0000-C7FFF]	160K	Available for Hi DOS memory
[C8000-DFFFF]	96K	Available for Hi DOS memory and adapter ROMs
[E0000-EEFFF]	60K	Available for UMB
[EF000-EFFFF]	4K	Video service routine for Monochrome & CGA adaptor
[F0000-F7FFF]	32K	BIOS CMOS setup utility
[F8000-FCFFF]	20K	BIOS runtime service routine (2)
[FD000-FDFFF]	4K	Plug and Play ESCD data area
[FF000-FFFFF]	8K	BIOS runtime service routine 1

I/O MAP

[000-01F]	DMA controller (Master)
[020-021]	INTERRUPT CONTROLLER (Master)
[022-023]	CHIPSET control registers I/O ports
[040-05F]	TIMER control registers
[060-06F]	KEYBOARD interface controller (8042)
[070-07F]	RTC ports & CMOS I/O ports
[080-09F]	DMA register
[0A0-0BF]	INTERRUPT controller (Slave)
[0C0-0DF]	DMA controller (Slave)
[0F0-0FF]	MATH COPROCESSOR
[1F0-1F8]	HARD DISK controller
[278-27F]	PARALLEL port 2
[2B0-2DF]	GRAPHICS adapter controller
[2F8-2FF]	SERIAL port 2
[360-36F]	NETWORK ports
[378-37F]	PARALLEL port 1
[3B0-3BF]	MONOCHROME & PARALLEL port adapter
[3C0-3CF]	EGA adapter
[3D0-3DF]	CGA adapter
[3F0-3F7]	FLOPPY DISK controller
[3F8-3FF]	SERIAL port 1

4.2 TIME & DMA CHANNELS MAP

TIME MAP:	TIMER Channel 0	System timer interrupt
	TIMER Channel 1	DRAM REFRESH request
	TIMER Channel 2	SPEAKER tone generator
DMA CHANNELS	DMA Channel 0	Available
	DMA Channel 1	Onboard ECP (Option)
	DMA Channel 2	FLOPPY DISK (SMC CHIP)
	DMA Channel 3	Onboard ECP default
	DMA Channel 4	Cascade for DMA controller
	DMA Channel 5	Available
	DMA Channel 6	Available
	DMA Channel 7	Available

4.3 INTERRUPT MAP

NMI		Parity check error
IRQ (H/W)	0	System TIMER interrupt from TIMER 0
	1	KEYBOARD output buffer full
	2	Cascade for IRQ 8-15
	3	SERIAL port 2
	4	SERIAL port 1
	5	PARALLEL port 2
	6	FLOPPY DISK (SMC CHIP)
	7	PARALLEL port 1
	8	RTC clock
	9	Available
	10	Available
	11	Available
	12	PS/2 Mouse
	13	MATH coprocessor
	14	Onboard HARD DISK (IDE1 channel)
	15	Onboard HARD DISK (IDE2 channel)

4.4 RTC & CMOS RAM MAP

RTC & CMOS	00	Seconds
	0	Second alarm
	02	Minutes
	03	Minutes alarm
	04	Hours
	05	Hours alarm
	06	Day of week
	07	Day of month
	08	Month
	09	Year
	0A	Status register A
	0B	Status register B
	0C	Status register C
	0D	Status register D
	0E	Diagnostic status byte
	0F	Shutdown byte
	10	FLOPPY DISK drive type byte
	1	Reserve
	12	HARD DISK type byte
	13	Reserve
	4	Equipment type
	15	Base memory low byte
	16	Base memory high byte
	17	Extension memory low byte
	18	Extension memory high byte
	19-2d	
	2E-2F	
	30	Reserved for extension memory low bytw
	3	Reserved for extension memory high byte
	32	DATE CENTURY byte
	33	INFORMATION FLAG
	34-3F	Reserve
	40-7F	Reserved for CHIP SET SETTING DATA

APPENDIX A: POST CODES

ISA POST codes are typically output to port address 80h.

POST(hex)	DESCRIPTION
01-02	Reserved
C0	Turn off OEM specific cache, shadow
03	1. Initialize EISA registers (EISA BIOS only)
	2. Initialize all the standard devices with default values. Standard devices includes
	-DMA controller (8237)
	-Programmable Interrupt Controller (8259)
	-Programmable Interval Timer (8254)
	-RTC chip
04	Reserved
05	1. Keyboard Controller Self Test
	2. Enable Keyboard Interface
06	Reserved
07	Verifies CMOS's basic R/W functionality
C1	Auto-detection of onboard DRAM & Cache
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
08	Test the first 256K DRAM
09	OEM specific cache initialization (if needed)
0A	1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers. Initialize INT no from 33-120 with Dummy (Spurious) Interrupt Handler
	2. Issue CPUID instruction to identify CPU type
	3. Early Power Management initialization (OEM specific)
0B	1. Verify the RTC time is valid or not
	2. Detect bad battery
	3. Read CMOS data into BIOS stack area
	4. PnP initializations including (PnP BIOS only)
	-Assign CSN to PnP ISA card
	-Create resource map from ESCD
	5. Assign IO & Memory for PCI devices (PCI BIOS only)

POST(hex) DESCRIPTION

0C
Initialization of the BIOS Data Area (40:ON ~ 40:FF)

0D
Program some of the Chipset's value according to Setup (Early Setup Value Program
2 Measure CPU speed for display & decide the system clock speed
3 Video initialization including Monochrome, CGA, EGA/VGA. If no display device found, the speaker will beep

▬
Test video RAM (If Monochrome display device found)
2 Show messages including:
    ·Award Logo, Copyright string, BIOS Data code & Part No
    ·OEM specific sign on messages
    ·Energy Star Logo (Green BIOS ONLY)
    ·CPU brand, type & speed
    ·Test system BIOS checksum (Non-Compress Version only)

0F
DMA channel 0 test

10
DMA channel 1 test

11
DMA page registers test

12-13
Reserved

14
Test 8254 Timer 0 Counter 2

15
Test 8259 interrupt mask bits for channel

16
Test 8259 interrupt mask bits for channel 2

17
Reserved

19
Test 8259 functionality

1A-1D
Reserved

1E
If EISA NVM checksum is good, execute EISA initialization (EISA BIOS only)

1F-29
Reserved

30
Detect Base Memory & Extended Memory Size

31
Test Base Memory from 256K to 640K
2 Test Extended Memory from 1M to the top of memory

POST(hex) DESCRIPTION

32
      Display the Award Plug & Play BIOS Extension message (PnP BIOS only)
2 Program all onboard super I/O chips (if any) including COM ports, LPT
      ports, FDD port... according to setup value

33- 3B
      Reserved

3C
      Set flag to allow users to enter CMOS Setup Utility

3D
      Initialize Keyboard
2 Install PS2 mouse

3E
      Try to turn on Level 2 cache
Note : Some chipset may need to turn on the L2 cache in this stage. But
usually, the cache is turn on later in POST 6 1h

3F 40
      Reserved

BF
      Program the rest of the Chipset's value according to Setup (Later Setup Value
      Program)
2 If auto-configuration is enabled, programmed the chipset with pre-defined
      Values

41
      Initialize floppy disk drive controller

42
      Initialize Hard drive controller

43
      If it is a PnP BIOS, initialize serial & parallel ports

44
      Reserved

45
      Initialize math coprocessor

46- 4D
      Reserved

4E
      If there is any error detected (such as video, kb...), show all the error messages
on the screen & wait for user to press <F1> key

4F
      If password is needed, ask for password
2 Clear the Energy Star Logo (Green BIOS only)

50
      Write all CMOS values currently in the BIOS stack area back into the CMOS

51
      Reserved

POST(hex) DESCRIPTION

52
1. Initialize all ISA ROMs
2. Later PCI initializations (PCI BIOS only)
    assign IRQ to PCI devices
    initialize all PCI ROMs
3. PnP initializations (PnP BIOS only)
    assign IO, Memory, IRQ & DMA to PnP ISA devices
    initialize all PnP ISA ROMs
4. Program shadows RAM according to Setup settings
5. Program parity according to Setup setting.
6. Power Management initialization
    Enable/Disable global PM
    APM interface initialization

53
1. If it is NOT a PnP BIOS, initialize serial & parallel ports
2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value

60
Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting.

61
1. Try to turn on Level 2 cache
   Note: If L2 cache is already turned on in POST 3D, this part will be skipped.
2. Set the boot up speed according to Setup setting
3. Last chance for Chipset initialization
4. Last chance for Power Management initialization (Green BIOS only)
5. Show the system configuration table

62
1. Setup daylight saving according to Setup value
2. Program the NUM Lock, typematic rate & typematic speed according to Setup setting

63
1. If there is any changes in the hardware configuration, update the ESCD information (PnP BIOS only)
2. Clear memory that have been used.
3. Boot system via INT 19H

FF
System Booting. This means that the BIOS already pass the control right to the operating system.

Unexpected Errors:

POST(hex) DESCRIPTION

B0
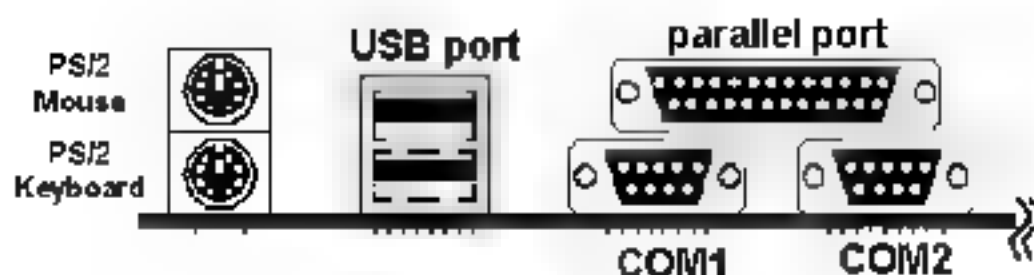If interrupt occurs in protected mode

B1
Unclaimed NMI occurs
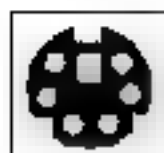
APPENDIX B: CONNECTORS

ATX Power Supply Connector:
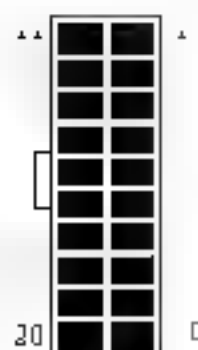
Signal Name	Pin	Pin	Signal Name
3.3V	11	1	3.3V
12.0V	12	2	3.3V
GND	13	3	GND
PS-ON	14	4	5.0V
GND	15	5	GND
GND	16	6	5.0V
GND	17	7	GND
5.0V	18	8	PW-OK
5.0V	19	9	5VSB
5.0V	20	10	12.0V

I/O back pannel connector:

PS/2 Mouse
PS/2 Keyboard
USB port
parallel port
COM1   COM2

PS/2 KEYBOARD & MOUSE CONNECTOR:

Pin	Signal Name
1	Data
2	Clock
3	GND
4	NC
5	VCC

COM1,COM2 : Serial Ports Connector

Signal Name	Pin	Pin	Signal Name
DCD		6	DSR
SIN	2	7	RTS
SOUT	3	8	CTS
DTR	4	9	RI
GND	5		

LPT 1 : Parallel Port Connector

Signal Name	Pin	Pin	Signal Name
STROBE		4	AUTO FEED
Data Bit 0	2	15	ERROR
Data Bit	3	16	INIT
Data Bit 2	4	7	SLCT IN
Data Bit 3	5	18	Ground
Data Bit 4	6	19	Ground
Data Bit 5	7	20	Ground
Data Bit 6	8	2	Ground
Data Bit 7	9	22	Ground
ACK	0	23	Ground
BUSY		24	Ground
PE	2	25	Ground
SLCT	3		

FDD1 Floppy Disk Connector
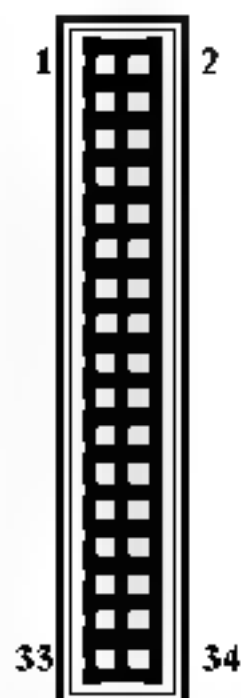
Signal Name	Pin	Pin	Signal Name
Ground	1	2	FDHDIN
Ground	3	4	Reserved
Ground	5	6	FDEDIN
Ground	7	8	Index
Ground	9	10	Motor Enable
Ground	11	12	Drive Select B
Ground	13	14	Drive Select A
Ground	15	16	Motor Enable
Ground	17	18	DIR
Ground	19	20	STEP
Ground	21	22	Write Data
Ground	23	24	Write Gate
Ground	25	26	Track 00
Ground	27	28	Write Protect
Ground	29	30	Read Data
Ground	31	32	SIDE SELECT
Ground	33	34	Diskette

IDE1,IDE2 Primary Secondray IDE Connector
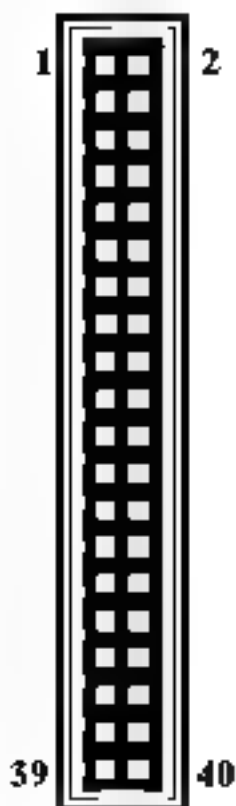
| Signal Name	Pin	Pin	Signal Name
Reset IDE	1	2	Ground
Host Data 7	3	4	Host Data 8
Host Data 6	5	6	Host Data 9
Host Data 5	7	8	Host Data 10
Host Data 4	9	10	Host Data 11
Host Data 3	11	12	Host Data 12
Host Data 2	13	14	Host Data 13
Host Data 1	15	16	Host Data 14
Host Data 0	17	18	Host Data 15
Ground	19	20	Key
DRQ3	21	22	Ground
I/O Write	23	24	Ground
I/O Read	25	26	Ground
IOCHRDY	27	28	BALE
DACK3	29	30	Ground
IRQ14	31	32	IOCS16
Addr 1	33	34	Ground
Addr 0	35	36	Addr 2
Chip Select 0	37	38	Chip Select 1
Activity	39	40	Ground

EP-51VPXC Layout
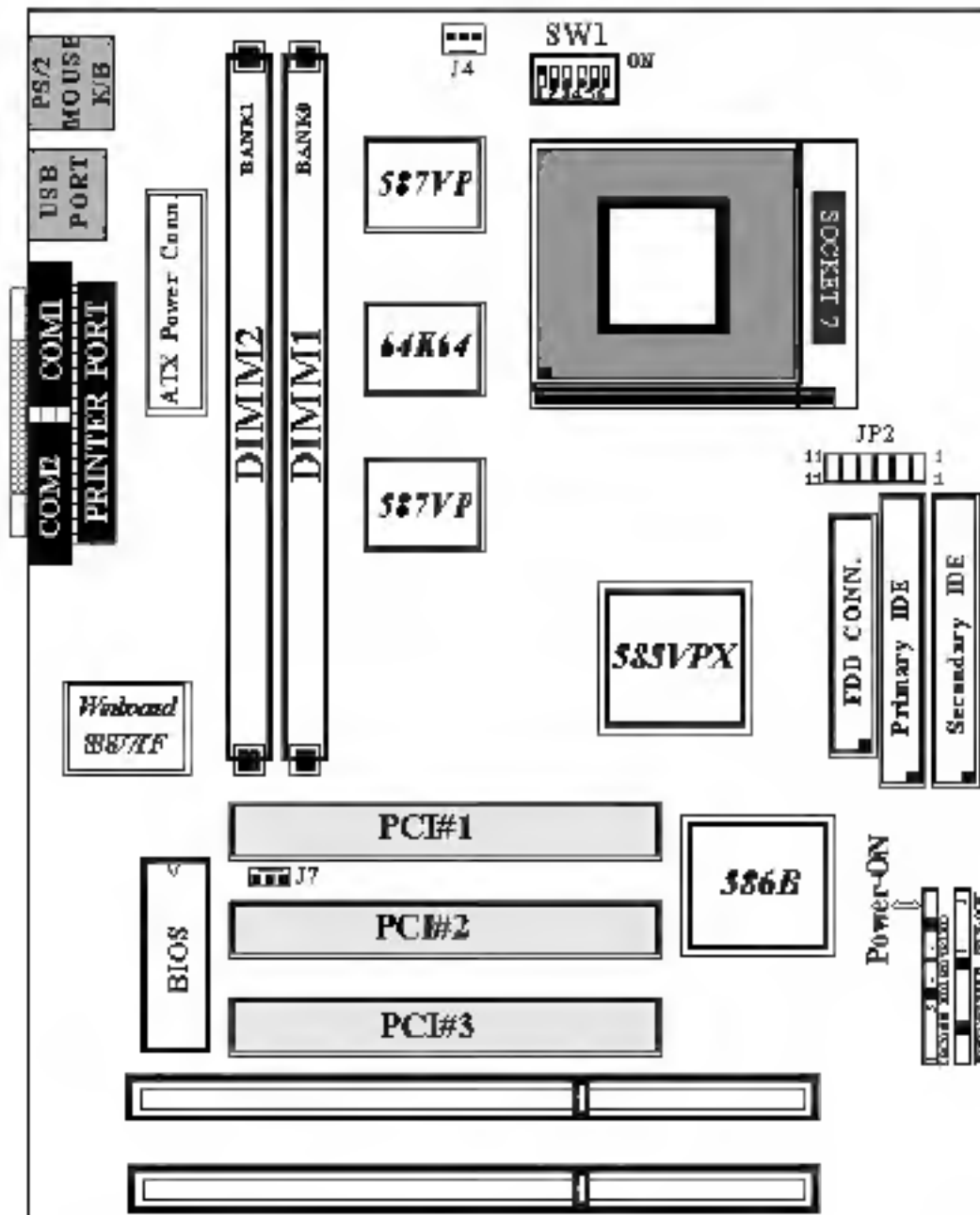
Figure 2-1

Note : SW1 setting

ON
▮ : Means ON

ON
▯ : Means OFF

Connectors and Jumpers

This section describes the connectors, jumpers and switch equipped in the mainboard. Please refer to **Figure 2-1** for the location of each connector and jumper.
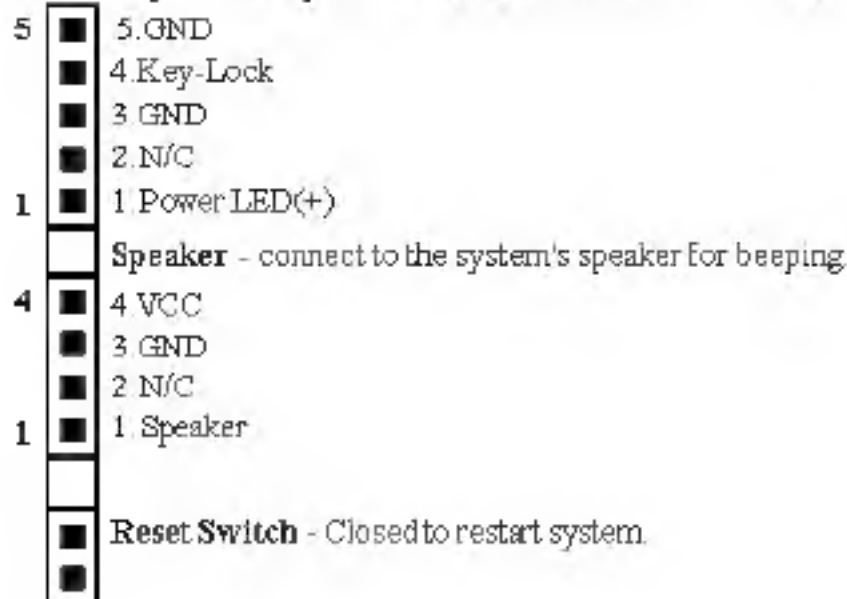
SW1 : CPU Selection						idtC6 PentiumMMX AMD K5 / K6	Bus Freqency x Multiplier	Cyrix & IBM 6x86(L) /6x86MX
1	2	3	4	5	6			
ON	OFF	OFF	ON	OFF	OFF	120MHz	60MHz x 2	6x86L-PR150
			OFF	OFF	OFF	133MHz	66MHz x 2	6x86/L/MX-PR166
			OFF	ON	ON		75MHz x 2	6x86/L/MX-PR200
			ON	OFF	ON		83MHz x 2	6x86MX-PR233
ON	ON	OFF	ON	OFF	OFF	150MHz	60MHz x 2.5	6x86MX-PR166
			OFF	OFF	OFF	166MHz	66MHz x 2.5	6x86MX-PR200
			OFF	ON	ON	188MHz	75MHz x 2.5	6x86MX-PR233
			ON	OFF	ON	208MHz	83MHz x 2.5	* 6x86MX-PR266
OFF	ON	OFF	ON	OFF	OFF	180MHz	60MHz x 3	
			OFF	OFF	OFF	200MHz	66MHz x 3	* 6x86MX-PR233
			OFF	ON	ON	225MHz	75MHz x 3	* 6x86MX-PR266
OFF	OFF	OFF	OFF	OFF	OFF	233MHz	66MHz x 3.5	* 6x86MX-PR266
ON	OFF	ON				* 266MHz	66MHz x 4	
ON	ON	ON				* 300MHz	66MHz x 4.5	
OFF	ON	ON				* 333MHz	66MHz x 5	

✻ *These settings are reserved for the future CPUs versions. When the future CPUs are ready and suitable for this mainboard, these settings will be correctly updated.*
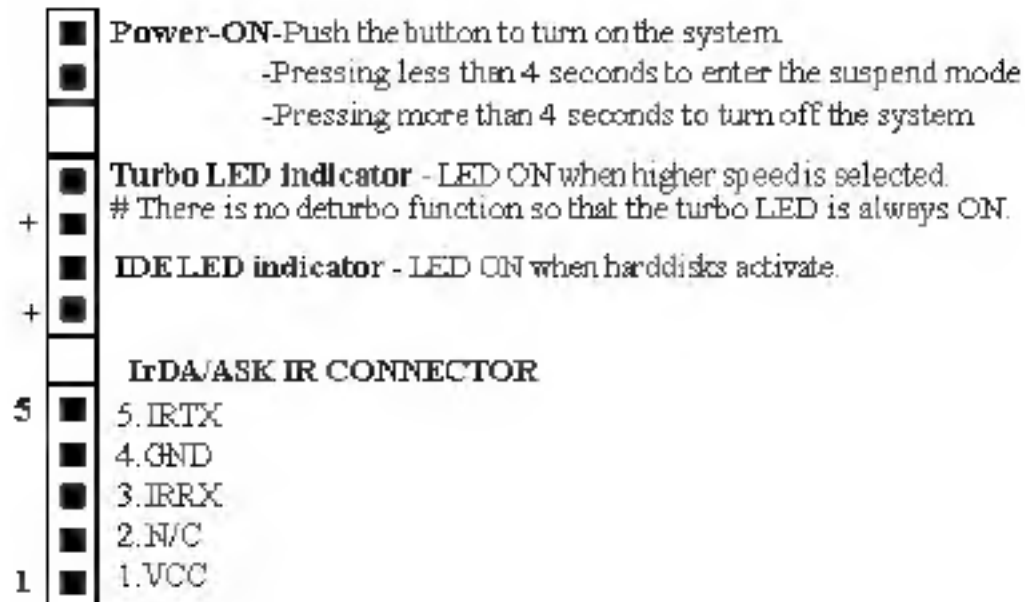
JP2 : CPU Vcore voltage selection:

11-12 : 3.5V for Pentium, AMD K5, Cyrix 6x86 and idtC6

9-10 : 3.2V for AMD K6-PR2-233

7-8 : 2.9V for AMD K6-PR2-166/200 and Cyrix 6x86MX

5-6 : 2.8V for Pentium MMX and Cyrix 6x86L

3-4 : 2.2V for AMD K6 3D CPUs

1-2 : 2.1V Reserved

J2

KeyLock - Keyboard lock switch & Power LED connector.

5 5.GND

4.Key-Lock

3.GND

2.N/C

1 1 Power LED(+)

Speaker - connect to the system's speaker for beeping.

4 4 VCC

3 GND

2 N/C

1 1 Speaker

Reset Switch - Closed to restart system.

J3

Power-ON-Push the button to turn on the system.

-Pressing less than 4 seconds to enter the suspend mode

-Pressing more than 4 seconds to turn off the system

Turbo LED indicator - LED ON when higher speed is selected.

+ # There is no deturbo function so that the turbo LED is always ON.

IDE LED indicator - LED ON when harddisks activate.

+

IrDA/ASK IR CONNECTOR

5 5. IRTX

4.GND

3.IRRX

2.N/C

1 1.VCC

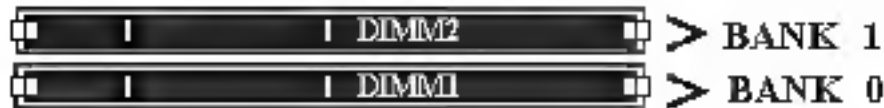**J4** **CPU FAN Connector**

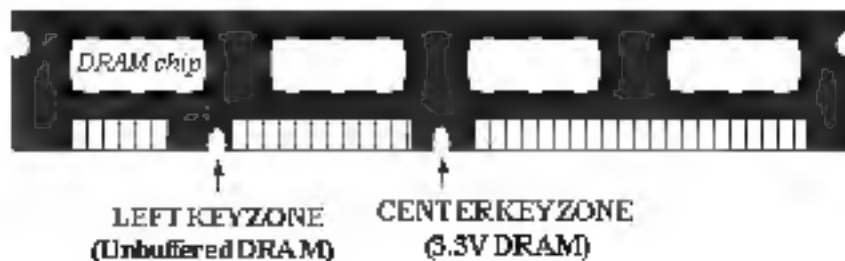**J7** **WOL (Wake-up On Lan) Connector**

System Memory Configuration

This mainboard supports different type of settings for the system memory. The following figures and table provides all possible memory combinations.

DIMM 1 (BANK 0)	DIMM 2 (BANK 1)	TOTAL MEMORY SIZE
8MB 16MB 32MB × 1 64MB 128MB	8MB 16MB 32MB × 1 64MB 128MB	MAX = 256MB

NOTE 1 :   The KEY ZONE of the DIMM socket is 3.3V / Unbuffered.

LEFT KEYZONE
(Unbuffered DRAM)

CENTER KEYZONE
(3.3V DRAM)

I/O back pannel connector: